

REMARKS

This paper is being submitted in response to the Office Action mailed June 20, 2003, for the above-referenced application. In this response, Applicants have cancelled claims 6, 8, 15, 17, 23 without prejudice or disclaimer of the subject matter thereof, amended claims 1, 9, 11, 14, 18, 20, 21, 25, 26, and added new claims 29-33 to clarify that which Applicants consider to be the invention. Applicants respectfully submit that the amendments to the claims and the new claims are fully supported by the originally-filed specification.

Applicants thank the Examiner for the indication of allowable subject matter in claims 11, 20 and 25. Applicants have rewritten these claims to include all of the limitations of the base claim and any intervening claims and respectfully submit that these claims are in condition for allowance. Concerning claim 11, Applicants respectfully submit that its dependence on claim 10 instead of claim 1 is a typographical error. Accordingly, claim 11 has been rewritten in independent form to incorporate the limitations of claim 1.

The objections to claims 8, 17, 23 and the rejection of claims 1-25 under 35 U.S.C. 112, second paragraph, have been addressed by amendments contained herein according to the guidelines set forth in the Office Action. Accordingly, Applicants respectfully request that these objections and rejections be reconsidered and withdrawn.

The rejection of claims 1-9, 12-18, 21-23, and 26-28 under 35 U.S.C. 102(a) as being anticipated by JP 2001-199177 to Kayama et al. (hereinafter "Kayama") is hereby traversed and reconsideration is respectfully requested in view of the amendments to the claims contained

herein.

Independent claim 1, as amended herein, recites a stencil for applying surface mount materials. The stencil includes at least two layers, including at least one reservoir pocket and at least one delivery aperture. The delivery aperture is adapted to deliver surface mount materials from the at least one reservoir pocket to a surface. Further, the reservoir pocket and the delivery aperture include contiguous and impermeable sidewalls at an adjoining interface. Claims 2-5, 7, 9, 10, 12, 13 and 30 depend directly or indirectly on independent claim 1 and recite additional patentable features thereto.

Independent claim 14, as amended herein, recites a stencil for applying surface mount materials, including an upper reservoir layer, a middle separation layer and a lower contacting layer. The upper reservoir layer includes at least one reservoir pocket. The middle separation layer includes at least one relief area which provides clearance for preexisting components mounted on a surface. Further, the middle separation layer includes at least one reservoir through pocket connected to the reservoir pocket in the upper layer. The lower contacting layer includes at least one delivery aperture that is adapted to deliver measured surface mount materials from the reservoir pocket and reservoir through pocket to the surface. The lower contacting layer further includes at least one relief opening connected to the relief area in the middle separation layer. Further, the reservoir pocket and the delivery aperture include contiguous and impermeable sidewalls at an adjoining interface. Claims 16, 18, 19 and 31 depend directly or indirectly on claim 14 and recite additional patentable features thereto.

Independent claim 21, as amended herein, recites a stencil for applying solder balls in a desired pattern onto a substrate. An upper layer is included with at least one ball drop reservoir aperture. A lower contacting layer is included with at least one relief delivery aperture which is adapted to draw solder material from at least one ball drop reservoir aperture and provides clearance for flux on pad sites on the substrate. Further, the ball drop reservoir aperture and relief delivery aperture include contiguous and impermeable sidewalls at an adjoining interface. Claims 22, 24 and 32 depend directly or indirectly on independent claim 21 and recite additional patentable features thereto.

Independent claim 26, as amended herein, recites a method for depositing surface mount materials onto a surface. Relief areas are matched in a stencil with preexisting surface mount components on a surface. The stencil is affixed to the surface. Surface mount materials are applied to the stencil such that surface mount materials fill reservoir pockets in the stencil. Surface mount materials are deposited onto the surface through delivery apertures which draw surface mount material from the reservoir pockets. Further, the reservoir pockets and the delivery apertures include contiguous and impermeable sidewalls at adjoining interfaces. Claims 27, 28 and 33 depend directly or indirectly on independent claim 26 and recite additional patentable features thereto.

The Kayama reference discloses a printing screen for printing onto circuit boards. The stencil includes multiple layers and contains a crevice 54 for storing material, a clearance-hole section 90 and openings 110 to deliver material.

Applicants' independent claims 1, 14, 21 and 26 all recite that the reservoir pockets and delivery apertures *include contiguous and impermeable sidewalls at an adjoining interface*. The contiguous and impermeable sidewalls are formed between layers and provide a solvent resistant barrier. (See page 4, lines 23-30, page 5, lines 8-12, and Figures 1 and 2). Applicants respectfully submit that Kayama does not teach or fairly suggest at least these features as claimed by Applicants. Kayama does not disclose any sidewalls as part of the delivery apertures and reservoir pockets. Accordingly, Applicants respectfully request that this rejection be reconsidered and withdrawn.

The rejection of claims 1-6, 8-9, 12-15, 17-18, 21, and 23 under 35 U.S.C. 102(b) as being anticipated by JP 3-92390 to Takahashi et al. (hereinafter "Takahashi") is hereby traversed and reconsideration is respectfully requested in view of the amendments to the claims contained herein.

Applicants' independent claims 1, 14, 21 and 26 and that claims that depend thereon are discussed above.

The Takahashi reference discloses a screen printing plate including multiple layers with recessed portions to match surface projections and areas for material storage and delivery.

As discussed above, Applicants' independent claims 1, 14, 21 and 26 all recite that the reservoir pockets and delivery apertures *include contiguous and impermeable sidewalls at an adjoining interface*. Applicants respectfully submit that Takahashi does not teach or suggest at

least this feature as claimed by Applicants. Takahashi does not disclose any sidewalls as part of the delivery apertures and reservoir pockets. Accordingly, Applicants respectfully request that this rejection be reconsidered and withdrawn.

The rejection of claims 7, 16 and 22 under 35 U.S.C. 103(a) as being unpatentable over Takahashi in view of U.S. Patent No. 6,096,131 to Hewett (hereinafter "Hewett") is hereby traversed and reconsideration is respectfully requested in view of the amendments to the claims contained herein.

The Takahashi is discussed above.

The Hewett reference is cited by the Office Action as disclosing that metal stencils are known in the art.

Applicants respectfully submit that the Hewitt reference fails to overcome the above-noted deficiencies of the Takahashi reference with respect to Applicants' independent claims. Specifically, neither Hewitt nor Takahashi, taken alone or in combination, teach or suggest at least the feature of reservoir pockets and delivery apertures that *include contiguous and impermeable sidewalls at an adjoining interface*, as is claimed by Applicants. Accordingly, Applicants respectfully request that this rejection be reconsidered and withdrawn.

The rejection of claims 10, 19 and 24 under 35 U.S.C. 103(a) as being unpatentable over with Takahashi or Kayama in view of U.S. Patent No. 6,047,637 to Chan (hereinafter "Chan") is

hereby traversed and reconsideration is respectfully requested in view of the amendments to the claims contained herein.

The Takahashi and Kayama references are discussed above.

The Chan reference is cited by the Office Action as disclosing a multilayer solder mask in which the layers are produced by dry-film lamination.

Applicants respectfully submit that the Chan reference fails to overcome the above-noted deficiencies of the Takahashi and Kayama reference with respect to Applicants' independent claims. Specifically, neither Chan, Kayama nor Takahashi, taken alone or in combination, teach or suggest at least the feature of reservoir pockets and delivery apertures that *include contiguous and impermeable sidewalls at an adjoining interface*, as is claimed by Applicants. Accordingly, Applicants respectfully request that this rejection be reconsidered and withdrawn.

The rejection of claims 26-28 under 35 U.S.C. 103(a) as being unpatentable over JP 7-323675 in view of Takahashi is hereby traversed and reconsideration is respectfully requested in view of the amendments to the claims contained herein.

The JP 7-323675 reference discloses a printing mask for printing solder on a board having protrusions. The mask includes recesses for containing the protrusions and a hole pattern to dispense the solder.

The Takahashi reference is discussed above.

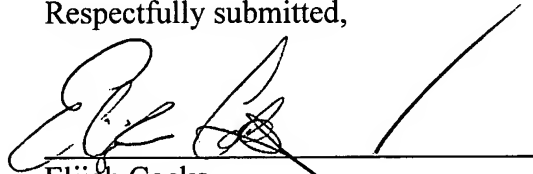
Applicants respectfully submit that the JP 7-323675 reference does not teach or fairly suggest at least the feature of reservoir pockets and delivery apertures that *include contiguous and impermeable sidewalls at an adjoining interface*, as is claimed by Applicants. Further, Takahashi fails to overcome the deficiencies of the JP 7-323675 reference with respect to Applicants' independent claims. Accordingly, Applicants respectfully request that this rejection be reconsidered and withdrawn.

Applicants have added new claims 29-33 and respectfully submit that these claims are allowable over the prior art of record.

Based on the above, Applicants respectfully request that the Examiner reconsider and withdraw all outstanding objections and rejections. Favorable consideration and allowance are earnestly solicited. Should there be any questions after reviewing this paper, the Examiner is invited to contact the undersigned at 617-248-4792.

Please charge any fees that may be required and which have not been provided for in accompanying documents or credit any overpayments to our Deposit Account No. 03-1721.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'E. Cocks', is written over a horizontal line.

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